

Furnace No. 20 $t_c >$
74°

23 $t_t > 58^\circ$
24 $t_t > 22^\circ$
25 $k > 70^\circ$

The following example shows the influence of the density of the medium which the jet of gas penetrates. For Furnace No. 20 the depth $H = 1\ 150$ mm at 74°.

Determining the depth of the jet at a temperature $t_i = Q^\circ$, there will be obtained

$$\bullet = 864 \text{ mm. } = - \sin^2 \alpha X \\ -1850-0$$

Therefore the flame or stream of hot gases does not touch the hearth, and the distance by which it falls short of so doing is $1150-864 = 286$ mm.

Therefore, in these five furnaces, each of 30 tonnes capacity, selected at random, such a velocity and an inclination have been given to the gas and the air in the heads that the flame settles to the hearth when the other portions of the furnace are at a comparatively low temperature.

It is evident that perfect repairing of the hearth is assured in this manner, but that it is not an advantageous arrangement in the regular working of the furnace. A similar investigation deals with the circulation of the hot gases in the long furnaces used in American plants, where the flues in the heads have a very slight slope and where the velocities are very low for the air and very high for the gas.

This data has been taken from Professor Pavlow's table for two 60-tonne furnaces, Nos. 35 and 36.

Making the same assumptions as in the case of the 30-tonne furnaces, the volume of air at 1000° will be 23 m³ 54 per second and the gas at the same temperature will be 16 m³ 88 per second.

Making the calculations for the temperature U at which it becomes possible to make bottom in these

furnaces, the results
are as follows: